

A REVIEW OF THE SPECIES OF THE GENUS SEMOTILUS.

BY ERNEST P. BICKNELL AND FLETCHER B. DRESSLAR.

In this paper we give the synonymy of the species of the genus *Semotilus*, with an analytical key by which they may be distinguished.

The specimens which we have studied belong to the Museum of the Indiana University, most of them having been collected by Professor David S. Jordan.

SEMOTILUS.

*Semotilus Rafinesque*, Ichth. Obiensis, 1820, 49 (*dorsalis*.)

*Leucosomus Heckel*, "Russeger's Reise, 1841, 1042" (*argenteus*.)

*Chelionemus Baird*, Storer's History Fishes Mass., 1855, 285 (*pulchellus*.)

*Analysis of Species of Semotilus.*

- a. Origin of dorsal fin about midway between middle of orbit and base of caudal; body rather robust, especially anteriorly. Vertebrae  $^{1} 22 + 20$ ; the interneural spine of first dorsal ray inserted between fifteenth and sixteenth neural spines. A distinct black spot on anterior part of base of dorsal; coloration dusky, little silvery, rosy below in spring.
- b. Scales comparatively small, crowded anteriorly, their number about 10-54-7; head large and broad, its length  $3\frac{1}{2}$  in head; maxillary barbel very small, indistinct in young specimens; eye small, 6 to 7 times in head (in adult); dusky bluish above, paler below; belly white; size medium, reaches a length of about a foot. *atromaculatus*. 1.
- bb. Scales rather large, not crowded anteriorly, their number about 9-48-5; head  $3\frac{3}{4}$  in length; maxillary barbel well developed; eye rather large, its diameter about four in head in young; dark bluish above and on upper part of sides, becoming rather abruptly light below lateral line; size small, attains a length of 3 inches or more. *thoreauianus*. 2.

<sup>1</sup> In *Semotilus atromaculatus*. This character has not been verified in *S. thoreauianus*.

*aa.* Origin of dorsal fin about midway between nostril and base of caudal; scales not crowded anteriorly, their number about 8-45-5; body rather more slender; vertebræ 22+20; interneural spine of first dorsal ray inserted between thirteenth and fourteenth neural spines; head moderate, about 4 in length; maxillary barbel very small; eye high up, about  $4\frac{1}{2}$  in head; color bright metallic bluish on upper part of body, becoming white below; no black spot on base of dorsal; size comparatively large, reaching a length of 18 inches. *bullaris.* 3.

1. *Semotilus atromaculatus.* Creek Chub, Horned Dace.

*Cyprinus atromaculatus* Mitchill, American Monthly Magazine, ii, 1817, 324 (Wallkill R.).

*Leuciscus atromaculatus* De Kay, N. Y. Fauna, Fishes, 1842, 210, plate xxxii, fig. 102; Storer, "Synopsis Fishes N. A., 1846, 409" (copied).

*Semotilus atromaculatus* Girard, Proc. Acad. Nat. Sci. Phila., 1856, 204.

*Leucosomus atromaculatus* Cope, Proc. Acad. Nat. Sci. Phila., 1861, 523.

*Semotilus dorsalis* Rafinesque, Ichth. Ohiensis, 1820, 49 (Kentucky); Kirtland, "Zoölogy Ohio, 1838, 169;" Kirtland, Boston Journal Nat. Hist., 1841, vol. iii, 184, 345.

*Leuciscus dorsalis* Storer, "Synopsis Fishes N. A., 1846, 411."

*Semotilus cephalus* Rafinesque, Ichth. Ohiensis, 1820, 49 (Kentucky); Kirtland, Zoölogy Ohio, 1838, 169; Kirtland, Boston Journal Nat. Hist., 1840, vol. iii, 345.

*Leuciscus cephalus* De Kay, N. Y. Fauna, Fish., 1842, 214; Storer, "Synopsis Fishes N. A., 1846, 409."

*Leuciscus storeri* Cuvier & Valenciennes, Hist. Nat. Poissons, vol. xvii, 1844, 319 (N. Y.).

*Leuciscus iris* Cuvier & Valenciennes, Hist. Nat. Poissons, 1844, vol. xvii, 255, plate 496 (N. Y. and Carolina).

*Leuciscus pulchelloides* Ayres, "Proc. Boston Society Natural History, 1849, vol. iii, 157."

*Leucosomus pallidus* Girard, Proc. Acad. Nat. Sci. Phila., 1856, 190 (Antelope Creek, Arkansas); Girard, Pacific R. R. Rept., 1858, 251, Pl. 61, fig. 6; Girard, Proc. Acad. Nat. Sci. Phila., 1858, 251-2 (Antelope Creek, Arkansas).

*Semotilus pallidus* Cope, Cyprinidæ Penn., 1866, 364 (Platte R.), (no description); Jordan, Manual Vertebrates, 1st ed., 1876, 279.

*Leucosomus incrassatus* Girard, Proc. Acad. Nat. Sci. Phila., 1856, 251-2 (Near Choctaw Agency); Girard, Pacific R. R. Rept., 1858, 252, Pl. 61, fig. 1 (Near Choctaw Agency).

- Semotilus spectosus* Girard, Proc. Acad. Nat. Sci. Phil., 1856, 204 (Sweet Water R., Nebraska); Girard, Pacific R. R. Rept., 1858, 283, Pl. 61, fig. 11 (Tributary of Platte River).
- Semotilus macrocephalus* Girard, Proc. Acad. Nat. Sci. Phil., 1856, 204 (Fort Pierre).
- Leucosomus macrocephalus* Girard, Pacific R. R. Rept., 1858, 252, Pl. 61, fig. 1 (Fort Pierre).
- Semotilus hammondi* Abbott, Proc. Acad. Nat. Sci. Phil., 1860, 474 (Kansas).
- Semotilus corporalis* Putnam, Bulletin Museum Comparative Zoölogy, 1863, 8 (synonymy only, not *Cyprinus corporalis* Mitchill); Cope, Proc. Acad. Nat. Sci. Phil., 1865, 85 (Platte River); Cope, Cyprinidæ Penn., 1866, 363, Pl. 10, fig. 2; Storer, History Fishes Mass., 1867, 256 (near Williams College, no description); Cope, Hayden's Geological Survey, Wyoming, for 1870, 1872, 442, 472 (Platte R.); Abbott, "American Naturalist, April, 1870, 12" (Delaware R.); Jordan, Indiana Geological Survey, 1874, 223; Jordan, Manual Vertebrates, 1st ed., 1876, 277; Jordan, Bulletin Buffalo Society Nat. Hist., 1876, 94; Jordan, Annals Lyceum Nat. Hist. N. Y., 1877, 327, 362, 368, 369, 376 (Oemulgee R., Etowah R., White R., Ind.); Jordan, Annals N. Y. Acad. Sciences, vol. i, No. 4, 107, 1877 (Housatonic R., Hudson R., Cayuga Lake, Genesee R., Delaware R., L. Erie, L. Michigan, Fox R., Rock R., Peckatonia R., Wisconsin R., Suamico R., White R., Illinois R., Ohio R., Kentucky R., Rock Castle R., Cumberland R., Salt R., Powell's R., French Broad R., Etowah R., Oemulgee R.); Jordan & Brayton, Bulletin U. S. National Museum, 1878, xii, 26, 38, 54, 68, 80, 86 (Saluda R., Oemulgee R., Clinch R., French Broad R., Rock Castle R., Alabama Basin, James R., Neuse R., Santee R., Gt. Pedee R., Tennessee R., Ohio R., Illinois R., and other streams); Hay, Proc. U. S. National Museum, 1880, 512 (Catawba Creek, Miss.); Jordan, Manual Vertebrates, 1880, ed. iii, 304; Hay, Bulletin U. S. Fish Commission, 1882 (Big Black R., Miss.); Jordan, Rept. Fishes Ohio, 1882, 863; Jordan & Gilbert, Synopsis Fishes N. A., 1882, 221; Bean, Catalogue Fishes exhibited International Exhibition, London, 1883.
- Leucosomus corporalis* Günther, Catalogue Fishes British Museum, 1868, 269 (Susquehanna R., Tioga Co., N. Y.; Lake Erie).

*Habitat.*—Dakota to Western Massachusetts, South to Georgia and Indian Territory, especially abundant in the Mississippi Valley. It is found especially in small brooks in the grass and weeds.

The specimens before us are from near Bloomington, Indiana; Clifty Creek, Ind.; French Broad River, Tenn.; Rock Castle River, Ky.; Rolling Fork, Ky.; Wolf Creek, Ky. We adopt for this species the specific name *atromaculatus*, instead of *corporalis*,

by which it has been usually known, because, in our judgment, the original *Cyprinus corporalis* of Mitchill is *Semotilus bullaris*, as was formerly stated by Dr. Abbott, while the present species is evidently Mitchill's *Cyprinus atromaculatus*.

The following is Mitchill's account of *Cyprinus corporalis*:—  
“*Cyprinus corporalis*. This fish is called by the Dutch, Corporalen, or corporal, and inhabits the Hudson in the neighborhood of Albany, the Wallkill through its whole extent, and the western streams and lakes from Wood Creek to the Oneida Lake, and so on.

“The length of a middle-sized individual is about thirteen inches, and the girth five; though he frequently grows larger.

“The head is smooth, roundish, thick, and without scales. The body is thickly covered with scales; on the back, more especially between the head and the dorsal fin, the hue is dusky; on the belly it is uniformly white, and on the sides the forepart of each scale is covered with a blackish film or pigment.

“Mouth toothless, and of a moderate gape; tongue distinct, but not free; gill-covers smooth.

“The tail is forked; the lateral line bends downward, and ends in the middle of the tail.

“The dorsal fin is near the middle of the back, and consists of seven rays; the caudal fin is composed of nineteen rays or thereabout.

“The anal has seven, the ventral seven, the pectorals have thirteen, the branchiostegous membrane has three rays, the dorsal and caudal fins are tipped with a blackish tinge.

“Takes the hook, if baited with dough, when let down through holes in the ice, at midwinter, in the Hudson at Albany; flesh eatable, but rather soft and coarse.”

## 2. *Semotilus thoreauianus*.

*Semotilus thoreauianus* Jordan, Bulletin U. S. National Museum, x, 63, 1877 (Flint River); Jordan, Bulletin U. S. National Museum, 1878, xii, 43 (Flint River); Jordan & Gilbert, Synopsis Fishes N. A., 1882, 221 (Flint River).

The specimens of this species in the Indiana University Museum were taken by Professors Gilbert and Swain, near Tuscaloosa, Alabama.

The original types were from the Flint River; no others have been reported.

This species is very close to *S. atromaculatus*, differing chiefly in the size of the scales.

3. *Semotilus bullaris*. Fall-fish, Roach, Dace.

*Cyprinus bullaris* Rafinesque, American Monthly Magazine, 1817, 120 (Hudson R.).

*Semotilus bullaris* Jordan, Annals N. Y. Acad. Sciences, vol. i, No. iv, 1877, 108 (Connecticut R., Delaware R., Susquehanna R.); Jordan, Manual Vertebrates, 1878, 304; Jordan & Gilbert, Synopsis Fishes, N. A., 1882, 222.

*Cyprinus corporalis* Mitchill, American Monthly Magazine, i, 1817, 289 (Hudson R.).

*Leuciscus corporalis* De Kay, N. Y. Fauna, Fishes, 1842, 213 (copied).

*Semotilus corporalis* Abbott, Proc. Acad. Nat. Sci. Phil., 1861, 152, 154 (Trenton).

*Leuciscus argenteus* Storer, Rept. Fishes Mass., 1839, 90 (Worcester County).

*Leucosomus argenteus* Heckel, "Russegger's Reise, 1841."

*Semotilus argenteus* Putnam, Bulletin Museum Comparative Zoölogy, 1863, 8 (synonymy only); Jordan, Manual Vertebrates, 1876, 278.

*Leuciscus pulchellus* Storer, Rept. Fishes Mass., 1839, 91 (Walpole, Mass.); De Kay, N. Y. Fauna, Fishes, 1842, 208; Cuvier & Valenciennes, Hist. Nat. Poissons, xvii, 320, 1844.

*Leucosomus pulchellus* Girard, Proc. Acad. Nat. Sci. Phil., 1856, 189.

*Cheilonemus pulchellus* Storer, History Fishes Mass., 1867, 286.

*Leucosomus pulchellus* Günther, Catalogue Fishes British Museum, 1868, vii, 268 (Montreal; Rangely Lake, Me.: Delaware River).

*Leucosomus chrysoleucus* Heckel, "Russegger's Reise, 1841" (not *Cypr. chrysoleucus* Mitchill).

*Leucosomus nitidus* De Kay, N. Y. Fauna, Fishes, 1842, 209 (Lake Champlain).

*Hybognathus nitidus* Girard, Proc. Acad. Nat. Sci. Phil., 1856, 210 (Lake Champlain).

*Leuciscus chrysopterus* De Kay, N. Y. Fauna, Fishes, 1842, 211 (New York Bay).

*Leucosomus rhotheus* Cope, Proc. Acad. Nat. Sci. Phil., 1861, 523 (Susquehanna River).

*Semotilus rhotheus* Cope, Synopsis Cyprinidae Penn., 1863, 362; Jordan, Manual Vertebrates, 1876, 278.

*Leucosomus cataractus* (Baird MSS.), Cope, Proc. Acad. Nat. Sci. Phil., 1861, 523 (Susquehanna River).

*Squalius hyalope* Cope, Proc. Acad. Nat. Sci. Phil., 1864, 280 (Cone-stoga River).

*Habitat*.—Southern Canada and Eastern United States, as far south as Chesapeake Bay.

The specimens examined by us are from Massachusetts.